

COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

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REACHING CTD: Telephone (64) (0)9-406-0651; 24 HOUR FAX (64) (0)9-406-1083

NEXT ISSUE DATE: November 5, 1997

COOP'S TECHNOLOGY DIGEST / SUBSCRIPTION INFO

There are ten (10) issues per year on a schedule dictated by industry events. The readership includes telecommunication industry consultants, broadcasters/telecasters, brown goods importers, retail stockists, installation and maintenance firm personnel, educators, regulatory agencies, business investors and Arthur C. Clarke. All copies sent via airmail / Fast Post. Annual subscription NZ\$250 per year within New Zealand, US\$250 per year outside. In Australia, CTD is represented exclusively by AV-COMM Pty Ltd, PO Box 225, Balgowlah NSW 2093: Tel. (61) 2-9949-7417; Fax. (61) 2-9949-7095. Outside of Australia, make payment out and mail to:

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COOP'S TECHNOLOGY DIGEST

October 1, 1997 ♦ VOLUME 97-8-41

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PART TWO: The Reality of Alternate Delivery Forms of Internet

The delivery of Internet access to individual homes and commercial establishments has become a world-wide quest to identify the most cost effective, trouble-free and consumer friendly delivery method. There have been many false starts and there will be more before an appropriate technical solution is identified and implemented.

Virtually everyone agrees that while the pre-Internet telephone wireline system is a convenient transportation system for early days Internet, it cannot support the continued expansion of the global data delivery service indefinitely. There are several reasons why this is so:

1) Internet is a bulk, volume user of wireline capacity and existing wired telephone systems were designed for occasional, not bulk use. Everything about the present day telephone network forces operational compromises on the Internet user.

Yes, the telephone networks can (and are being) systematically upgraded to bulk ("broadband") capacity; no, this cannot and will not happen fast enough to satisfy the exponential growth rate of Internet.

2) Internet usage is primarily one-way; the majority of user time is spent receiving data (files) and this creates a badly one-sided loading on pre-Internet wire line telephone services.

3) Internet information is sourced roughly in proportion to the level of technical sophistication times population world-wide. India has the second largest national population base but does not even make the top 100 countries in terms of Web sites (data caches). India is an "importer" of Internet data while conversely the United States is an "exporter" (i.e., on a daily basis it sends more Internet data outside the country than it brings in from the balance of the world). And this also has a dramatic loading affect on the design and day to day operation of wire lines now transporting Internet.

Internet is characterised as a gigantic "web" of interconnected computers when in fact it is millions of "islands" which form temporary connections for relatively brief periods of time on a non-predictable basis. Internet usage is driven by world events; the death of Princess Diana caused massive overloads of Web sites dedicated to the activities of the Princess in the UK. The American landing on Mars in July caused an even larger overload of circuits to California as more than a million Internet users in two days attempted to access Mars Lander reports and photos from Internet Web sites established for that purpose. With enthusiastic Internet hardware providers projecting annual equipment sales growth from 10 to 25% per annum for the next five years, the outlook for the wireline providers who provide the connections upon which Internet depends is frightening. Internet is both a curse and a blessing to the world's wireline telecommunication system operators. To date Internet has been driven almost totally by non-wireline innovators and consumer response to the services on offer.

Because there is no actual "Internet body" or regulatory authority, the activities on Internet are largely unsubstantiated by any form of measurement system. Wireline providers can tell us the net effects of Internet data flow on their overall transmission capabilities, individual Web sites can report on the number of "hits" (requests for data or access) they have experienced in a measurement of time unit (such as per 24 hours). Nobody pretends to be able to measure the global month to month growth in Internet usage.

The majority of Internet usage is confined to a pair of general categories. The first is the e-mail (Email) use which allows an Internet connected PC to send a text or data file to a specific individual.

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Email is the lowest cost method of transferring text and data files yet developed - the delivery is usually within a few hours to any global destination, the cost is measured in pennies rather than dollars. Commercial use of Email is very significant because it has proven to reduce corporate/business communication costs (intra-company and inter-company) by often incredible amounts (some say 90%). Here's the major point: For Email the Internet connection must be two-way capable.

The second attraction of Internet is Web site browsing; access to data bases maintained by private and commercial institutions. For many business firms, Internet has become a new merchandising tool allowing the display and detailed explanation of virtually any product you can name; an electronic catalogue. For non-commercial Web sites, Internet allows instantaneous transmission of cached (Web site) data to tens of millions of users who access their site "on line." And that major point again: Web site browsing requires two-way connection capability for at least a portion of the connect time.

In an effort to popularise and cheapen the Internet product, a number of technical schemes have been created. They fall into two general categories:

- 1) Techniques which use non-telephone line delivery of the Internet data to the user, but still rely upon the telephone line connection for the user to send his requests to Internet;

- 2) And techniques which use non-telephone line delivery of the Internet data to the user and do not provide for a user's direct connection to Internet.

The easiest way of cutting costs in delivering Internet is to eliminate the telephone line connection, reducing the service from a communications circuit to a *broadcast* circuit. Hardware and user costs are significantly reduced if Internet is treated like a TV broadcast service and transmitted to any receiver within reception range of a local or regional transmitter. How is that useful if so much of Internet depends upon interaction by the user?

The answer is in the software. In Europe, MediaNet created a service that broadcasts Internet data files through TV broadcast transmitters as a "hidden signal" using a portion of the TV broadcaster's "VBI" (vertical blanking interval). MediaNet users (customers) purchase a "decoder" box which connects to their TV set aerial much as a VCR does, and then to the user's PC. The decoder intercepts the Internet transmission and special software provided to the user on disc allows access to the data stream by subject matter category. MediaNet operates on a daily "schedule" not unlike a TV programme schedule: Stock market material is transmitted at 9AM, sport information at 9.30AM, science news at 10AM and so on through the day. The user's PC is keyboard commanded to intercept and "save to hard drive" the data requested. If sport information is requested, the user can access it anytime *after* the download scheduled time (i.e., not in real time). Topics are repeated with updated material several times each day.

This process is very similar in concept to our existing teletext service and the technology is nearly identical; the primary difference is the addressability of each decoder (i.e., the service operator can elect to deliver the service to specific decoder units). What this eliminates, however, is the individual user ability to access specific Web Sites on command, and, use of Email.

MediaNet has sold "rights" to their technology and software to a Queensland group which to date has been unsuccessful in finding a TV broadcaster to carry their VBI data stream. The Australian group claims exclusivity for the MediaNet package for all of the Pacific and Asia (as well as North America) and perhaps prematurely offers a decoder box for A\$198. In the end, MediaNet is one-way, still retains a monthly user (subscription) fee (which varies upwards from A\$15 per month), and reduces Internet to a schedule specific broadcast category of operation. And, the user still must have a PC in the home (or office) to make use of this service.

WebTV is a variation of MediaNet, first announced and sold in the USA. The WebTV founders perhaps saw the need for an in-home PC as a marketing impediment and believed the next generation of Internet "users" would be more comfortable if their "decoder" worked in conjunction with the existing (family) television set. MediaNet depends upon the user's PC for memory and data storage as well as operational commands and on screen display. WebTV makes use of the TV set as a display device, and builds-in data storage and memory ability. This eliminates the in-home PC requirement but the original offering did not attack the one-way nature of the broadcast transmission format. The original WebTV decoder boxes sold in the US marketplace for US\$250 on average; users must still

subscribe to the basic service. The current version of WebTV goes half way to the level of full Internet interactivity by adding a telephone modem to the decoder and making it possible for the user to make specific requests for access to Web sites as well as adding Email capability. In this generation, WebTV has a hardware package and software system that makes it possible for first-time Internet users to do virtually everything a dedicated telephone line Internet user can do, only at a slower speed. The costs have gone up slightly (US\$300 for the decoder) as well.

What creators of a similar design have done is to eliminate the real time on-line requirement for the download phase of Internet. The user still uses the wireline connection to request data (or send Email) but once the data request (or Email) has been sent, the telephone connection is broken and the user depends upon the broadcast side of the service to deliver to the user the requested data. None of this works quite as fast or as flawlessly as being directly wireline connected for the full Internet exchange but in the trade there are entry level cost savings and in theory a faster download of material once it has been requested, found and transmitted.

Which brings us back to the point where we left this subject in CTD for August: Finding a technical way around the bottleneck created by overloading the telephone circuits with too many simultaneous users and speeding up the delivery speed of data files beyond the technical capacity of the wirelines.

Enter ACTONZ

In a news release created June 6th by Wellington PR firm Communication Trumps Ltd, account executive Norrey Simmons wrote about ACTONZ:

"Wellington entrepreneur Scott Anderson is the venture capitalist who has facilitated the bringing together of a technologically advanced power metering system and a state-of-the-art billing and customer care system. Trials of the power metering system are now in hand, and sales and final trials of the customer care and billing system are so far underway in 12 countries.

"The smart metering system development was driven by a Wellington company, Locator Systems Ltd. While the metering system is revolutionary, the batch interfacing billing and customer care system, BACCIS, which is being marketed by ACTONZ, has been identified as a potential world leader in utilities customer service management. For an energy utility, the two technologies combined in the right way allow power use and other services to be constantly monitored and managed in real time. Further, by using power lines to transfer data, utilities have a wide range of new opportunities to offer customers value-added services. Systems which use phone lines or radio to communicate face technical and cost problems which have been largely overcome by the use of power line modems."

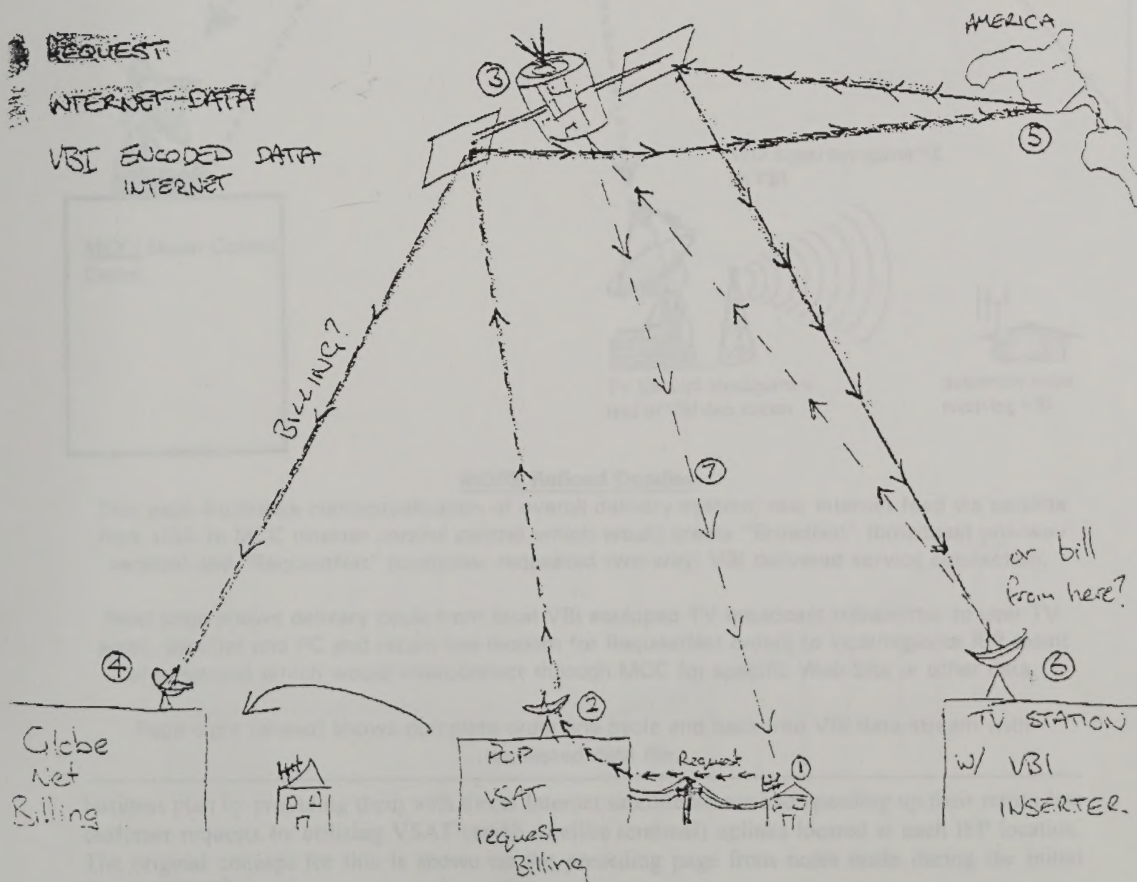
Anderson's software development management skills are directly related to a larger plan that involves selling investment shares in software ownership packages. High tax rate individuals have been pitched \$300,000 investment shares in a plan that allows, Anderson claims, the individuals to recoup 80% of their original investment in the first 3 years against software depreciation tax write-offs. In effect, says Anderson, such an individual can continue to pay high taxes each year for the next three years, or, cut the tax bite by 80% with a pass through of software depreciation from his or her invested funds. For all of this to work, Anderson has to marry the investors to commercial software product partnerships and maintain a relationship with IRD that accepts the original valuation and depreciation schedule for the software as established by ACTONZ.

What all of this has to do with Internet delivery revolves around Anderson's initial decision to purchase New Zealand rights to an Internet delivery system created by Australian Eric Fien of Broadnet International (1). Fien's system has the perhaps unique ability to allow Internet users to connect in two separate formats: As receivers-only of Internet data "broadcast" in a manner similar to the European MediaNet process, or, as interconnected users as with the current version of WebTV but at costs which are significantly lower than anything WebTV seems capable of offering. Anderson's ACTONZ saw in the Fien Broadnet solution an elegant marriage of an available delivery system (the VBI offered to Broadnet by Television New Zealand; CTD 9707, p. 9), hardware (decoder) which could in theory be manufactured by an Anderson involved company (Exicom in Porirua), and software which Fien had facilitated along with a completely packaged operational system. To fund this, Anderson proposed to utilise funding which he was receiving from investors under is tax depreciation pass-through scheme. As noted in CTD9707, ACTONZ personnel saw in this project an opportunity to "leverage" existing Internet Service Providers (ISPs) into the ACTONZ

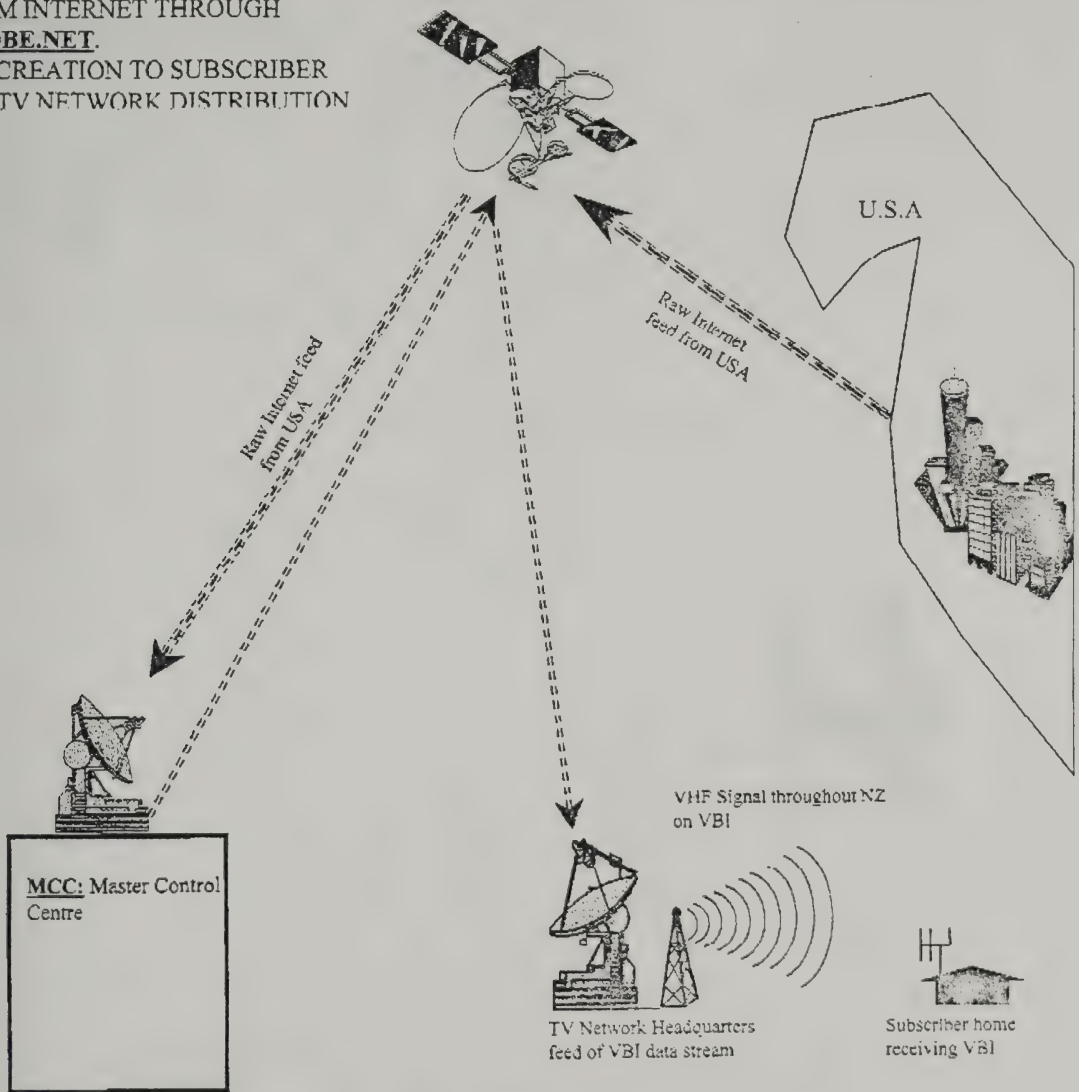
DOODLES: ACTONZ Technical Research Manager Sam O'Connor while meeting with Eric Fien of Broadnet sketched the inter relationships between a direct Internet feed from the USA and its redistribution via TVNZ VBI as show here. O'Connor notes said:

- "1. Using a normal Internet browser the home user does a search and clicks on to an item of interest.
- "2. The request for data is transmitted over normal phone lines to a Point of Presence (or an ISP that will forward it to the POP) which is equipped with a VSAT satellite uplink.
- "3. The request is beamed to a satellite in geostationary orbit. Details about the user and the request are sent to Globe.Net billing (4). This request is sent to the U.S. Internet backbone (5).
- "4. Globe.Net receives information to be used for billing, details on the user and the amount of data they are receiving.
- "5. The requested Internet data is sent from the U.S. backbone to the satellite and then down to the TV station (6).
- "6. At the TV station the data is converted to a suitable format for transmission and inserted into the VBI portion of a normal TV signal, before being sent to the satellite (or as broadcast by terrestrial means).
- "7. The TV signal is received by the normal aerial. A decoding/decrypting card in the computer strips the requested data from the VBI portion and displays it. All of this happens faster than one of today's modems."

what will the latency be like?



FROM INTERNET THROUGH
GLOBE.NET.
 VBI CREATION TO SUBSCRIBER
 VIA TV NETWORK DISTRIBUTION



MORE Refined Doodles:

This page illustrates conceptualisation of overall delivery system; raw Internet feed via satellite from USA to MCC (master control centre) which would create "BroadNet" (broadcast one-way version) and "RequestNet" (customer requested two-way) VBI delivered service connection.

...

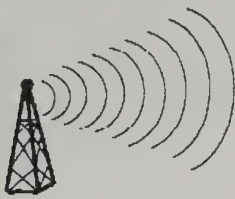
Next page shows delivery cycle from local VBI equipped TV broadcast transmitter to user TV aerial, decoder and PC and return line modem for RequestNet orders to local/regional ISP (point of presence) which would interconnect through MCC for specific Web Site or other data.

...

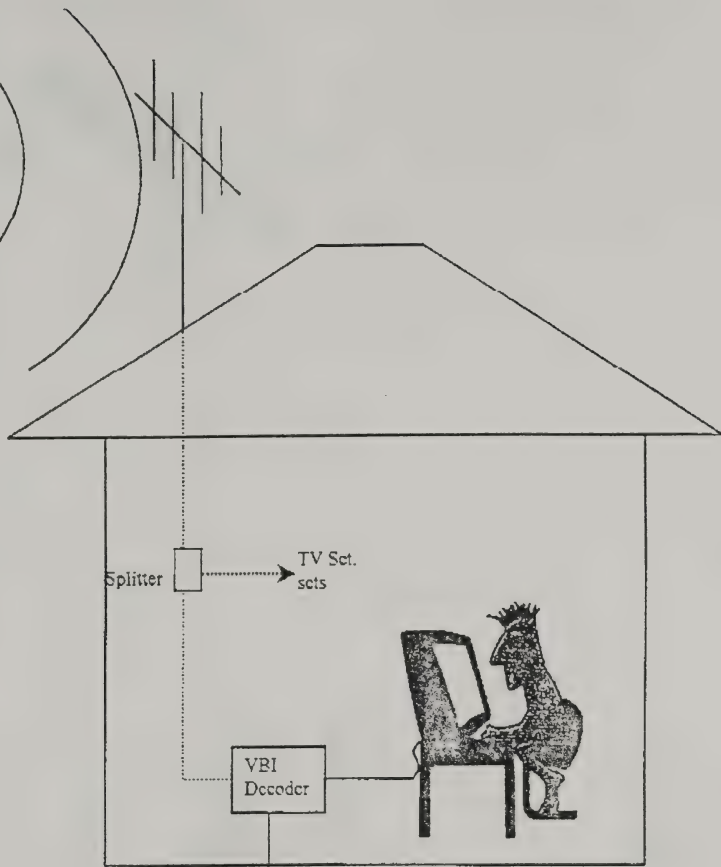
Page eight (ahead) shows complete order line cycle and back into VBI data stream with requested data file.

business plan by providing them with direct Internet satellite access and speeding up their return line customer requests by utilising VSAT (small satellite terminal) uplinks located at each ISP location. The original concept for this is shown on the preceding page from notes made during the initial Fien/ACTONZ meeting.

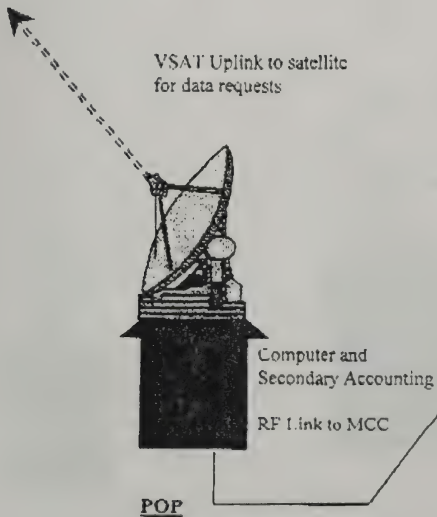
WITHIN SUBSCRIBER FACILITY
AND BACK TO POP FACILITY



VHF TV signal with VBI data

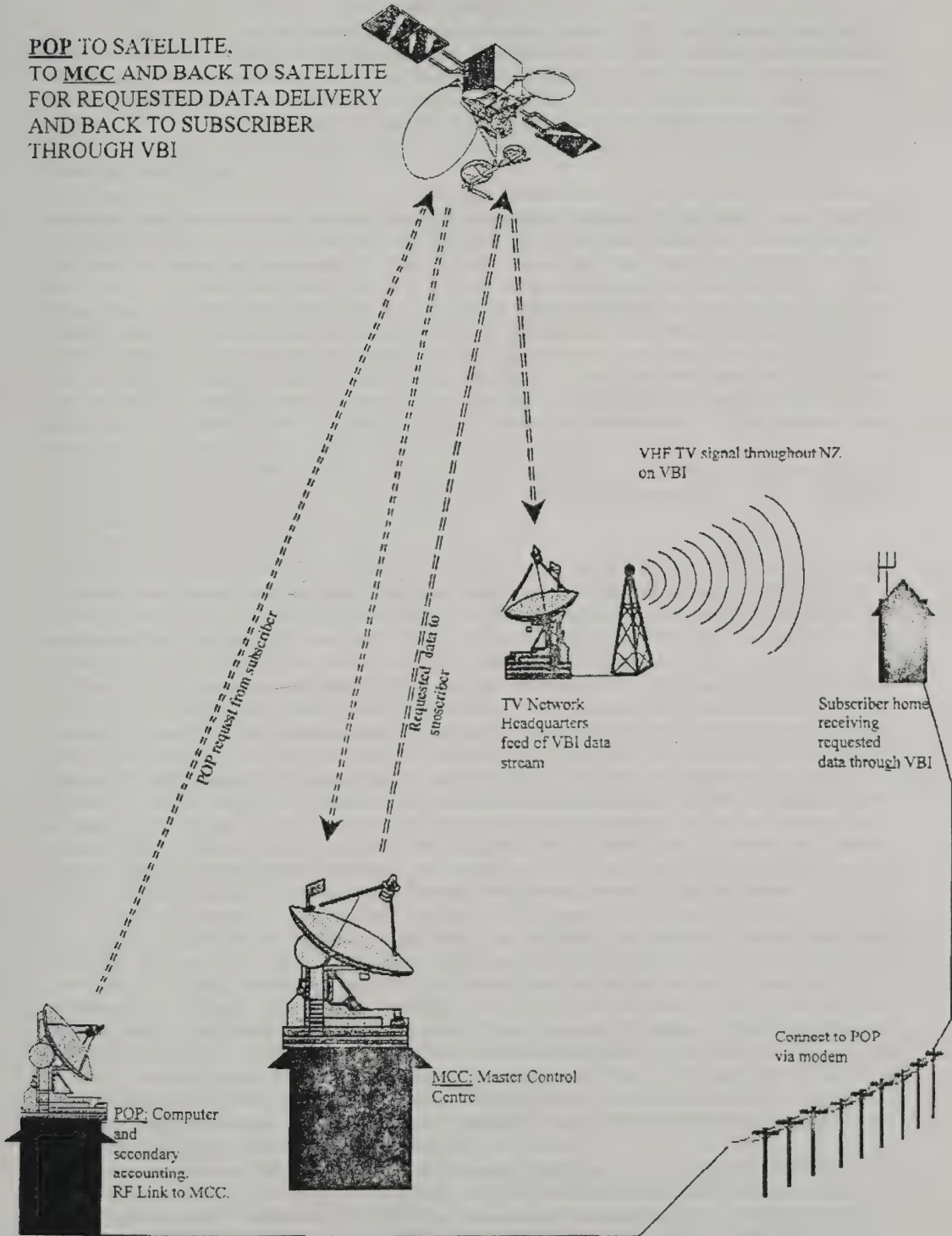


Modem return via POTS to POP



POP

**POP TO SATELLITE,
TO MCC AND BACK TO SATELLITE
FOR REQUESTED DATA DELIVERY
AND BACK TO SUBSCRIBER
THROUGH VBI**



But at least one ACTONZ advisor, Lou Parun who's business card says he is a "Director," was not convinced Fien's Broadnet system was realistic. Parun would pen on April 14th:

"I have spoken ...to people...regarding the performance issues of VBI. The general consensus is that VBI is at best a very good broadcast (one way) medium and not suited to normal Internet which is a two way technology. (At our Wellington meeting) Eric Fien indicated that VBI could handle 100,000 users on a two-way (RequestNet) system. As we understand it, however, the available VBI lines cannot handle this number of users because of bandwidth restrictions."

Parun had gone to a US consultant, Robin Davis, to look for the flaws (if any) in Fien's system. Davis explained to Parun:

"There is a limit to the amount of data that can be transmitted using a line of VBI, although (that line) can be received by anyone with the appropriate hardware. If the data is encrypted so that only one card (customer) can decrypt the data, all of the other cards still receive the data; they are just unable to reconstitute it. The amount of user data that can be transmitted down a VBI line is 36 bytes and each VBI line is transmitted 50 times per second giving a data throughput equivalent to 14,400 bps. If two lines of VBI are allocated to data broadcasting, this would result in a throughput of 28,800 bps. It should be noted that this data stream is unidirectional and there is no handshaking. Which means several assumptions must be made; 1) that the person that you want to receive the message has their machine switched on, 2) that their reception is good. If either of these is not true then a 'single shot' transmission will stand a good chance of failure. One way around this is to repeat the transmission but the question then becomes how often (do you repeat) and for what duration?"

Davis was saying to Parun, with a one way system there is no guarantee that the requested data was properly received since the one-way nature of the system does not allow for a handshake (verification) of the correct data stream reception.

Fien defended his system and responded:

"I am well aware of both the Philips and Sony VBI based servers and the companion Intericast, Hypercast and WavePhone systems that have been used with limited success over as long as 8 years. None of these systems can adequately correct transmission errors and the system we are recommending has virtually zero errors (1×10 to the 12th power) with a reasonable (TV broadcast) signal level and low 'overheads' in the data stream sense.

"(The existing systems) data transfer rates are very low due to the absence of any refined data compression system being inbuilt into the software. The system I am recommending has the industry's very best data compression technology - very similar in fact to the system used by (European) MediaNet, which does achieve the 400 k/bits/sec rate. Furthermore, the overheads inherent in the Intericast technology were a severe limiting factor in the overall performance. The (Broadnet) system has a fully integrated software system that includes, within the main stream, a complete Software Control System for automatic billing and selection of the modem 'back channel' (link) where that is required. All decoders are, individually, in banks or globally, addressable - all by software selection at the uplink site. The receiver on the individual decoder board can even be reset to another input channel (frequency) entirely by remote control.

"As for the nonsense comment about serving 100,000 users simultaneously, let me state that no system in the whole southern hemisphere (or probably the northern hemisphere) even attempts to serve 100,000 customers simultaneously. They simply don't have 100,000 incoming (fax, data, telephone) lines (to the Internet source) to handle such a large number of simultaneous requests. Our largest Internet provider in Australia has a total (real fax plus pseudo-lines) of just under 800 (incoming lines). What happens, of course, is that customers are switched in and out of the server queue, since the modems normally run at 14.4, 28.8 or (a few at) 33.6 k/bits/sec while the process server runs at 125 MHz. There is an awful lot of very high speed switching involved, and it is this server switching which ultimately limits the throughput. None the less the system we offer does not magically create anything more than our promised 400 k/bits/sec, but it does maintain that rate all of the time.

"As any real user will advise, when you are actually downloading from the typical ISP server, it is not at the notional 14.4 (or 28.8 or 33.6) rate, but typically 500 - 1500 bits per second - if you are really lucky! Possibly at 3.21AM on a cold, snowy Sunday morning you might reach the modem's claimed delivery speed, but not too often (if ever) at other times. Furthermore it often (at least in Australian capital cities) takes quite a few dial in attempts before you get a

connection, and then there are quite long 'wait' periods during the normal 'conversation' between the user and the ISP server."

Parun was still not convinced and sought the advice of Daniel Santilli, Manager of Philips VBI Data Broadcast Systems in The Netherlands. Santilli advised:

"VBI does not solve the delivery speed problem, although because of the way VBI is delivered (through broadcast TV transmissions) it is possible to truly reach 100,000 users with very fast market penetration (everyone who has a TV receiver aerial will have instance access). It has been our experience in a test system that when there are 500 simultaneous users, they will be utilising the equivalent of 16 Mb/s of 'bandwidth'."

To which another US expert, Rick Siegel, added for Parun:

"I do not see VBI as much of a tool when it is a relic of standard broadcast TV (analogue). And analogue displays are likely to not be here in five to ten years. Er-goes the VBI, as digital TV takes its rightful place in the world."

Siegel's comment brings to focus an interesting concern of those who might see analogue VBI as a business bridge to long term profitability. It turns out that the vertical blanking interval (VBI portion of the TV signal) is in fact an artefact of analogue TV. And when you are transmitting television in a digital format, there is no equivalent to the VBI. "Er-goes the VBI" simply translates to - if you turn off the analogue TV transmitters and the VBI is not replaced in digital TV transmitters with a VBI equivalent, what happens to the delivery system you established using VBI for your business plan?

No VBI, no delivery scheme. No business.

While Parun and his technical crew at ACTONZ were identifying reasons why they could not support the Broadnet VBI proposal for the firm, firm President Scott Anderson was having second thoughts for reasons of his own. On May 20th, he announced his concerns that if ACTONZ went ahead with the proposed Broadnet system acquisition, **"I don't know who will run this or how it will run. We have no one on board who is capable of operating this as a business."** The size of the project may have finally been coming into focus. What had originally looked like a modest increase in overhead (in personnel and investment) to create a scenario which would **"control the Internet business in New Zealand"** (Lou Parun; April 1997) had turned into an investment that might top NZ\$10 million. The risk factor was growing larger each day as Fien's staff refined the hardware system on paper and projected the costs for 20+ VSAT equipped ISPs, a master control centre (MCC) and a rebuild of the ACTONZ planned Globe.Net facility in Wellington.

Anderson pondered, **"Do we need all of those VSATs? Suppose we do this without any VSATs and depend upon the existing Telecom or Clear points of presence for our backhaul and request line requirements?"**

Within days (May 23rd), he was showing even less enthusiasm in the project. **"I don't think we can actually make (real) money with the RequestNet (two-way) system; suppose we look just at being a broadcaster with (the one way) Broadnet VBI system?"** His new concerns questioned ACTONZ staff projections of six year revenues totaling more than \$24 million (see page 12, here).

But there were problems with backing out of the plan. Anderson in approaching the Internet delivery business had seen it primarily as a way of drawing together various software programmes which would become additional "depreciable assets" for his investment portfolios. And as software is their primary business, some mention of "Internet software" had been made by the ACTONZ personnel (including Anderson) when they talked of their corporate plans to take New Zealand bred software world-wide. Publicity already nearing public consumption mentioned Internet and the corporate plans to be an important provider of this service.

To keep the Internet plan "alive" became important for ACTONZ; admitting that it was dead could be a problem with statements previously made by the firm's employees and associates. To that end, Anderson wrote a letter on May 23rd which stated in part:

"We advise our interest in purchasing ...the VBI technology and all related rights. To this end we would like to proceed to a documentary stage with ...TVNZ ... and the satellite people as outlined in our previous communication. I understand Mr. Fien will firstly assure these parties of our continued interest and co-ordinate the documentary procedure and final negotiations."

Fine was simultaneously getting additional messages from ACTONZ personnel. Nicola Dunkerley, Product Manager, Finance was suggesting to Broadnet that funding for the acquisition of the Broadnet system was "five to seven weeks away." And that was early June.

June would flow into July and then August with neither side showing an inclination to complete the agreement. Finally on August 5, in response to a Fien memo of August 1, Anderson would write Eric Fien:

"I am surprised that you have been awaiting for a business plan from Actonz, or your intimation that Actonz was responsible for conveying a business plan to TVNZ. Our clear understanding was that you would be supplying a business plan to us, under the terms of the contract."

And so the great plan has died. Documents studied by CTD indicate that one of the early and more important steps in the implementation of the Broadnet system within New Zealand was a requirement by TVNZ that they understand the relationship with ACTONZ. Why? Because ACTONZ was proposing (as is 'standard' in this industry) to pay TVNZ for VBI 'space' based upon the number of customers ACTONZ attracted to the service. Accordingly, TVNZ was asking:

"(I will be interested in knowing something about) how ACTONZ intends to market this service in New Zealand, and their projections for its uptake. (TVNZ) will probably be looking for a minimum number of subscribers at \$3 (per subscriber) per month in year one (but modest enough so that it is realistic with projected growth) and then a further minimum after a period of time - perhaps 2 years."

There are several reasons why ACTONZ (or anyone else at this stage) is not providing an Internet VBI connection in New Zealand. First and foremost, in the ACTONZ instance perhaps is Scott Anderson's (late) realisation that this was a business that would require personnel and equipment far greater than he had anticipated (at one stage he was under a belief that the system could be implemented for NZ\$500,000; a number that grew over a few months to more than NZ\$10m). But perhaps more importantly, Lou Parun's concerns about VBI advisability aside, is the realisation that nobody yet knows enough about the Internet user universe to determine what "marketing hot buttons" turn users on and cause them to want an Internet connection. By some generous estimates, there are up to 125,000 Internet capable PCs in New Zealand at this time; approximately 1 home or business in 10 nation-wide. But being equipped for - and - being a regular (as in daily or weekly) user of the Internet system are two quite different levels of involvement. And for now, there is not adequate market data available to allow a sound business judgement. The challenge of Internet, both technical and financial, remains an elusive enigma and no amount of fancy, new technology seems likely to change that fact in the next few years.

-Note: See cash flow and financial forecast on page 11 to complete this report-

1/ Eric Fien, BroadNet International Pty Ltd, PO Box 6063 South Coast Mail Centre, NSW 2521, Australia; tel ++61-42-724122; fax ++61-42-724033; email cssia@ozemail.com.au

Part one of this report appeared in CTD 9707 for August 28, 1997.

CALL FOR PAPERS - PRESENTATIONS

SPACE Pacific, the Pacific Ocean Region satellite and cable trade association, announces the 1998 South Pacific Region Satellite & Cable Show (SPRSCS) "Call for presentation papers." Individuals or firms wishing to make technical, marketing or product presentations during the course of the plenary session days (January 29, 30 and 31) are invited to contact Bob Cooper at SPACE (tel 64-9-406-0651; fax 64-9-406-1083) prior to November 15th. Papers to be presented may cover any relevant subject relating to the status or development of hardware, software, or marketing programmes related to the continued growth of the satellite and cable industries in the Pacific Region. Presenters will have full use of state-of-the-art graphics, a 400+ seat auditorium venue, and an opportunity to speak for periods of 15 to 60 minutes.

Deadline for submission proposals: November 15, 1997

ACTONZ's Cashflow and Financial Forecast for "Internet TV" over Six Year Period

INTERNET TV DRAFT CASHFLOW & FINANCIAL FORECAST FOR 6 YEARS										
PAGE ONE - PROFIT AND CASH FORECAST										
	1997	1998	1999	2000	2001	2002	6-Year			
SALES UNITS										
Market Growth	112%	132%	50%	10%	0%	0%	0%			
Market Size	243,800	565,616	848,424	933,266	933,266	933,266	933,266			
Penetration	2.00%	15%	20%	25%	25%	25%	25%			
TOTAL CONNECTIONS	4,876	84,842	169,685	233,317	233,317	233,317	233,317			
NEW CONNECTIONS	4,876	79,966	84,842	63,632	0	0	0			
SALES PRICES										
Decoder Cards	\$150	\$150	\$300	\$300	\$300	\$300	\$300			
Monthly Fee - Broad Net	\$20	\$20	\$20	\$20	\$20	\$20	\$20			
Percentage on Broad Net			30%	30%	30%	30%	30%			
Monthly Fee - Request Net	\$35	\$35	\$35	\$35	\$35	\$35	\$35			
Percentage - Request Net		60%	70%	70%	70%	70%	70%			
SALES DOLLARS										
Decoders	901,395	21,217,227	25,452,720	19,089,540	0	0	0			66,660,882
Broad Net	72,112	6,489,992	1,018,109	1,399,900	1,399,900	1,399,900	1,399,900			11,779,911
Request Net	84,130	2,970,412	4,157,278	5,716,257	5,716,257	5,716,257	5,716,257			24,360,590
Request Net Volume Charges	0	0	0	0	0	0	0			0
TOTAL INCOME	1,057,637	30,677,630	30,628,106	26,205,696	7,116,156	7,116,156	7,116,156			102,801,382
DIRECT COSTS										
Decoder Cost	135,209	3,182,584	3,817,908	2,863,431	0	0	0			9,999,132
Sales Commission	297,460	7,001,685	8,399,398	6,299,548	0	0	0			21,998,091
Install Commission	297,460	7,001,685	8,399,398	6,299,548	0	0	0			21,998,091
Internal Material	12,019	1,622,498	339,370	466,633	466,633	466,633	466,633			3,373,786
Transmission	18,078	2,433,747	509,054	599,950	599,950	599,950	599,950			5,060,679
Software	21,033	2,839,371	593,897	816,608	816,608	816,608	816,608			5,904,125
Request Volumes	2,404	486,749	118,779	163,322	163,322	163,322	163,322			1,097,097
TOTAL DIRECT COSTS	783,613	24,568,319	22,177,803	17,609,040	2,146,513	2,146,513	2,146,513			69,431,801
LESS DIVISIONAL EXPENSES										
Overheads as per page two	148,803	1,200,417	1,206,417	1,206,417	1,206,417	1,206,417	1,206,417			6,174,887
Advertising - Broadcast	20,000	600,000	600,000	600,000	600,000	600,000	600,000			3,020,000
OPERATING PROFIT (LOSS)	105,221	4,308,894	6,643,886	6,790,240	3,163,227	3,163,227	3,163,227			24,174,695
Less Depreciation	0	0	0	0	0	0	0			0
NET BEFORE TAX	105,221	4,308,894	6,643,886	6,790,240	3,163,227	3,163,227	3,163,227			24,174,695
EFFECT ON CASH-BAL SHEET CHANGES										
Change in Assets per page three	0	0	0	0	0	0	0			0
Change in Liabilities per page three	0	0	0	0	0	0	0			0
Change in Equity per page three	0	0	0	0	0	0	0			0
EFFECT ON CASH-GST										
GST received on sales=cash inwards	132,205	3,834,704	3,928,513	3,275,712	889,520	889,520	889,520			12,850,173
GST paid on expenses=cash outwards	-110,365	-3,184,342	-2,886,278	-2,315,182	-382,366	-382,366	-382,366			-9,260,898
Net GST received (paid) per year	21,840	21,840	21,840	21,840	21,840	21,840	21,840			131,041
GST Refund (Payable) to IRD	0	0	0	0	0	0	0			0
Period Cash Change - surplus/(deficit)	127,061	4,330,734	6,665,726	6,812,080	3,185,067	3,185,067	3,185,067			24,305,735
CLOSING CASH POSITION	127,061	4,457,795	11,123,522	17,935,601	21,120,668	24,305,735	24,305,735			

SPRSCS '98

- **January 27-28** (Mark Long Tutorial Course: Digital Satellite TV Installations)
- **January 29-31** (General Plenary sessions, exhibit hall, hands-on tutorial courses)
- **January 31** (Open Public Day - the opportunity to meet consumers and display the latest in satellite reception technology)

A booklet describing SPRSCS '98 (Auckland, NZ) is now available; write SPACE Pacific, PO Box 30, Mangonui, Far North, New Zealand or fax 64-9-406-1083

TECHNOLOGY BYTES

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October 1, 1997 • VOLUME 97-08-41

Satellite TV and Radio

Nokia clarification helping to better understand the plentiful variety of MPEG-2 receivers. The 9XXX series was originally designed under the broad "Nokia Mediamaster" family line for European users; the 8XXX series was created with software and function variations for non-European markets. The exception to this is the 2XXX series which is patterned after the 9XXX series and is designated specifically for the Chinese SCPC market (of which, 15,000 of their model 2000 had been sold and shipped to China by mid-August). Within the 9XXX series is the now infamous German "d-box" which has been significantly bastardised by individuals and firms Nokia labels as "pirates" (this series with software modifications accesses MPEG services which Nokia never intended). Also in the same 9XXX series is the 9500-Irdeto which Nokia created for the Italian pay-TV market, the 9200 which is a European FTA (free to air) MPEG-2 software version, and a 9600 which is for Scandinavia and Spain and is equipped with something Nokia calls a "common interface." The 9XXX series is physically different from the 8XXX series by having multiple SCART plugs for connecting then IRD to TV set(s), VCR(s), and other typical home style equipment. The 8XXX series has phono plug outputs for video and audio and includes an RF modulator which is designed for the marketplace where it will be sold (i.e., to match the local UHF-TV terrestrial broadcasting standard so as to be usable with a standard TV set for playback purposes). The 8XXX includes the 8200 FTA version, the 8500 Irdeto version and an 8600 "common interface" version. In 1998, Nokia will introduce second generation models with additional variations as follows: In the 9XXX family, the 98XX which will have a "common interface," the 97XX which will function with "proprietary conditional access" (such as? BSKyB and other Murdoch family transmissions, PowerVu, General Instrument Digicipher), and, the 8400 FTA with common interface. In the 1998 line for non-European markets will be the 8400 FTA version, the 8700 "proprietary conditional access" and the 88XX common interface. For those who have made it a passion to attempt to keep up with the numerous new Nokia releases during the first 9 months of 1997, the new year will be an even greater challenge!

PanAmSat plan to use over the air transmission technique to "upgrade" all existing PowerVu D9223 receivers currently in use world-wide (SatFACTS September 15th, p. 1) has become albatross around neck of the satellite firm and receiver supplier Scientific-Atlanta. Here is background. Uniquely, PanAmSat and MPEG hardware supplier Scientific-Atlanta had chosen for reasons unexplained to use a common "network identifier" for all of the SA equipped PowerVu uplinked bouquets on every PanAmSat bird around the world. This means, in essence, European, Asian, Pacific, South American and North American feeds all had the same "network address" in digi-speak. D9223 receivers were factory shipped, authorised in the field and operated all as a part of digi-speak network "0" (as in zero). There was a hazard with this decision: Instructions intended for one of the networks could quite easily be received and misinterpreted as instructions by a second network. It would be akin to your sharing a postal mail box at the local post office with everyone in your town or city. As the PanAmSat satellites have loaded up with ever more digital bouquets, the opportunity for instructions sent to one specific bouquet (and the associated receivers using that bouquet) to end up mis-instructing a different bouquet have increased. In particular, when two bouquets share a similar (if not identical) operating frequency but on opposite polarities on the same satellite, "leakage" of instructions sent to a horizontal bouquet to receivers tuned to the vertical (polarity) bouquet has become something of a problem. PanAmSat and SA decided the time had arrived to upgrade the network "addressing" level of the literally hundreds of bouquets now operating around the world. To do this, the software in every SA D9223 receiver must be "updated" with new software. PowerVu was designed to allow "over the air upgrades" (i.e., so that new version software could be transmitted to receivers to replace old software). This is where someone made their first mistake. To upgrade the software, one of two things must happen. Either, (1) a human being must be stationed at each receiver being upgraded to push buttons on the D9223 when instructed and to check that the new software is being properly downloaded, or, (2) a programming bouquet such as Central China Television (CCTV) simply incorporates the software upgrade into their normal programme transmission stream and hopes that all receivers tuned in are actually turned on, functioning, and receiving a signal of sufficient quality to allow the upgrade to take place. Alas, neither

assumption is proving valid. SA won't say how many D9223 receivers are now in use; estimates vary upwards from 7,500. And SA may know where no more than 50% of the total are actually located. By not knowing where they are, SA and PanAmSat now realise they have no way to reach the receiver owners with word of the upgrade and to explain what must be done to get the upgrade. CCTV used their over the air programme transmission four days in a row early in September to advise viewers of the upgrade and gave instructions covering leaving their receivers turned on to allow the software upgrade to take place. Unfortunately, for the software upgrade to work the receiver owners had to tune in the announcement, follow the instructions given (in Mandarin) and hope their dish system was working properly throughout the exercise. Sadly, some reportedly did not and receivers got only a part of the upgrade. What is wrong with that is that during the upgrade the software residing in the receiver at the outset is erased, leaving the receiver "dumb" and then new, upgraded software is downloaded as a replacement. Many receivers got as far as having their old software erased but never got the full download so they ended up dumb or worse - halfway between dumb and renewed. PanAmSat had advised late in August that they planned to have all receivers upgraded by October 15th, world-wide. As reported in sister publication SatFACTS on September 15th, PanAmSat Senior Director of Program Services on August 29th had advised a small, discrete group of programmers that:

"It is of the utmost importance to have all DVB decoders switched to a Network ID setting of '1'. Once PanAmSat and other Customer owned DVB digital platforms create multiple Network IDs, any decoders remaining in the old default setting of '0' will cease to operate and be completely unrecoverable after 72 hours. These IRDs will NO LONGER be functional."

(Underlining and bold face construction by PanAmSat, not us.)

Attempts by SatFACTS to obtain clarification on this "threat" to make receivers "unrecoverable after 72 hours" met with a stonewalling at PanAmSat and cries of dismay (but no assistance nor instructions) from Scientific-Atlanta. We now learn that if a receiver has been left with Network "ID" of "0" and PanAmSat begins the post-downloading change to renumbering all bouquets, that receivers still in the "0" setting mode are likely to find their software circuits "overloaded with new information" to the point that over a short period of time (from a few hours up to a maximum of 72 hours) the non-updated receivers will simply "overload" with new information. And while there is some non-official (that is, not endorsed nor sanctioned by either Scientific-Atlanta nor PanAmSat) suggestion that a hard reset of the receiver (back to a semi-dumb state) could be done in the field by a knowledgeable software person, as Elizabeth Dickens warned on August 29th, it is more likely "These IRDs will NO LONGER be functional." SatFACTS on September 15th with the assistance of New Zealand hardware distributor Bay Satellite TV Ltd. and Australian distributor Av-Comm Pty Ltd. posted instructions on these two firm's Internet Web Sites (<http://www.baysat.co.nz/baysat> and <http://www.avcomm.com.au>) giving step by step instructions to place D9223 units into the cautionary Network ID "1" state.

French language DTH service for the Pacific is promised by Tahiti affiliated firm that is scheduled to begin tests on I701 (180E), MPEG-2 DVB with two programme channels initially. Service will test with scheduled January 1 start using either hemi beam coverage for west and spot beam for Tahiti, or more likely, Global beam coverage which equates to 26 dBw signal levels over all of Pacific from Tahiti to western Australia, north into Asia. This is 7 dB lower in level than hemispheric and zone level signals from the same satellite. And this says that for an equivalent 6 dB C/NR (minimum recommended for MPEG-2 reception at C-band) a 3.9m (13 foot) dish will be required. Which takes the programming package out of the "acceptable backyard dish size" for most suburban/urban regions in Australia and New Zealand. The project backers, however, say their target market is the vast Pacific region including the Cooks, New Caledonia, Vanuatu, Wallis and Futuna, Western Samoa and American Samoa. Two French language channels? Paris based Canal Plus is one, the second for the test sequence is unannounced. So too is the format of MPEG-2 and the acceptable brand of receiver(s). However, as this is a French project the chances are good the receivers will originate in France. That says Sagem or Thomson, and as for the conditional access, CTD understands it will be a "smart card" based system which strongly suggests the French Telecom developed Viaccess (which is also the announced CA system for SPACE TV Systems Mandarin and Adult Triple X package on I702 at 177E). Beyond the 2 test channels, the backers claim there is a "mature plan" to expand by midyear 1998 to 80 channels of service "originating in Canada and Europe." Does this mean 80 French language channels (far more than even France has available)? No, according to our source; the programming within the 80 planned channels would be approximately 50% French and 50% English. Too ambitious? Time will tell and for now it is the newest kid on the block. Details from Raymond Wohler (Wohler Communication Telediffusion), BP 499 Papeete at tel 689-43-23-78 (Also, see next report.)

Major increase in French language television is planned for 1998, world-wide. French government now believes their support is required to increase presence of French culture in increasingly "anglo-sized world." Goal is to provide not fewer than five French language channels to virtually any spot on the globe; which five is matter of internal study at office of French President. For French territories, RFO 1 and RFO 2 are mandatory part of the mix. Government funded CFI is likely third and privately funded TV5 is 4th. At this point the

discussions break down with Canal + (a pay television service featuring movies), Antenne 3 (which is already represented with programming from CFI and RFO) in the running along with several newer cable and DTH distributed services. Plan is to bundle a package of programming in digital bouquet, with French government paying for or heavily subsidising the costs to make the programming available in areas where it is presently not available. To date, CFI and TV5 have made private arrangements for satellite coverage. The "global presence" of American services (CNN, ESPN, Discovery and others) and the growing Anglo presence of British programming (BBC World, Sky News London, UK TV and others planned for 1998) is reported to have triggered French decision to not fall behind English language services. As a single digital bouquet, possibly available through new PanAmSat satellite to Pacific late in 1998, service would reach virtually entire Pacific and Pacific Rim.

RFO on I180 (701) will "stay on present 31 dBw Global footprint" for minimum of two additional year, according to RFO source. RFO-2, long promised, remains liquid in launch date with latest tentative schedule "late in 1997." How RFO can claim a "31 dBw Global beam footprint" is not known as Intelsat itself specifies Global for this satellite at 26 dBw. 31 dBw is closer to the hemi or zone beam (33 dBw) quoted number.

SPACE TV Systems (Intelsat 702, Ku, 177E) finally went to conditional access (September 12); some six weeks after planned August 1 start date. Bouquet has again been reconfigured with 12 audio or data channels (512 through 501) and 9 video channels (208 through 200, as they load). Apparently not included: Exxxtasy triple-X adult channel which previously had unique channel identifier (904). Taiwan sources are offering the CD.TV200 receiver in region of US\$900 but without the smart card required for authorisation. One Taiwan source is claiming the cards will add US\$400 per year to the receiver first-year price (i.e., US\$1,300 range) when available.

Playboy Channel on I180? True. Service has been seen on Mondays around 0500-0800 UTC on Vidiplexed (2 video signals sharing same interleaved frame) 3935 (1215) RHC, audio on 6.32 subcarrier. Choice of sending "PC" out on I180 seems to be optional on part of uplink technician in Los Angeles area as numerous "non-standard" programme sources are seen on this Vidiplex feed, especially Saturday and Sunday late evenings USA west coast time (Sunday and Monday late afternoon, early evening in NZ and Australia). Interesting perception test: Husband and wife tuned to Vidiplex service without Vidiplex decoder (see below) which results in two separate video images overlaid on top of one another. The audio is adjusted to the American sitcom "Mad About You" and one of the two sets of video is adjusted to the companion imagery. The second image, drifting over or below the sitcom is Playboy Channel. The husband, without benefit of Playboy audio is enthralled by the adult movie while the wife, staring at the same screen and hearing the sound of the sitcom goes a full 15 minutes before asking the husband to explain his heightened anxiety. Both are staring at the same screen, one only sees the sitcom image while the other only sees the Playboy image. To the wife, the Playboy image was not even there!

Vidiplex decoders, capable of separating two interleaved video signals such as are transmitted on two transponders of Intelsat 701 at 180E, are suddenly "hot items" in the marketplace. Vidiplex of US network signals from ABC, CBS and NBC as well as Fox and UPN Network stations in Los Angeles are common fare for 12 to 15 hours daily (3935 and 4140 MHz, RHC). Vidiplexed process was created by RCA in 1970s, works as follows: Each (NTSC) image contains 525 lines of which 262.5 are "odd number lines" and 262.5 are "even number lines." By using alternate lines for each of two video sources, two completely separate video sources can be transmitted as a single signal (while companion audio is sent on discrete subcarriers). At receive end, Vidiplex "decoder" selects even or odd number lines, frame stores the lines and in more elaborate decoders recreates the missing lines to hand out a complete 525 line image at the end. Switch on front selects "odd field" or "even field"; hence, user chooses which image to receive. Without decoder, two images appear simultaneously (a form of encryption although intent was to save transmission space, not prevent unauthorised viewing). In New Zealand, Bay Satellite TV (tel 64-6-843-5296) is stocking Taiwan built Vidiplex decoder: in Australia, AV-COMM Pty Ltd (tel 61-2-9949-7417) has two separate approaches. One is full decoder, second is add on box that is used in conjunction with any frame store capable standards converter. Future of Vidiplexing is unknown; ultimately these feeds can be expected to convert from relatively open access (Vidiplexed) analogue to some form of MPEG digital.

ESPN's single programme channel analogue service on PAS-2 (3860Vt) was replaced with a four channel PowerVu digital service on the same frequency September 24. The new service (Msym 26.470, FEC 7/8) also has a pair of audio channels (5 and 6 in MPEG mode, 10 and 11 in DVB mode) which carry coded tones to direct cable TV and broadcaster switching away from and back to the network for local advert insertion. The new package of programming includes ESPN News (a US all sport news service) on channel 1, ESPN2 on channel 2, ESPN USA on channel 3 and ESPN International on channel 4. The service was (very) briefly FTA for 24 hours, is now conditional access. ESPN has also been feeding their international service within the California bouquet (channel 8) for approximately 6 months.

Other satellite transponder changes and additions: Sky Australia horse and dog racing on AsiaSat 2, Vertical has moved their 1/2 transponder signal from 4015 to 4020 MHz; other parameters stay the same. Interesting background music source: Radio station KLOS-FM, Los Angeles, transmitted in stereo on 3876.5 MHz RHC Intelsat 701 at 180E; subcarriers at 5.4 and 5.6 MHz. Station calls itself "Southern Fried Rock" and is musical hits of the 60s, 70s and 80s with live concerts. Analogue CNBC on Measat 2 (148E) 4.160 GHz, PAL format, audio at 5.6 MHz sub-carrier. Asian reports say there are additional Measat-2 Ku band digital services operating; 10.982 and 11.044 (both horizontal) with Msym of 30,000, FEC 3/4.

Indostar S-band satellite was shipped from builder Orbital Sciences to Ariane South American facility with launch likely before end of this month. Someplace in all of the releases covering this new S-band bird there is confusion - some say 106.6E and others say 107.7E. It won't make much difference in locating satellite once it launches, however; it will be the only S-band bird in the Sky in that region. Hardware for S-band (feeds, LNBs)? Skandia Electronics Pty Ltd at Melbourne (tel 61-3-9819-2466). Projected footprints remain closely held "secret" but some spill over into at least northern Australia is a given. Indostar plans to move from three C-band transponders on Palapa C2 to the new S-band bird, and convert an estimated 50,000 C-band customer installations, when the satellite is operational.

ACESAT, Australia's first satellite TV equipment distributor (established 1983), has been acquired by Comet Installations. Kingsley Munday, Chairman of Comet reports his firm is "largest installer of satellite equipment in Australia," largely on the back of Galaxy/Australis/(Fox Satellite) Ku band DTH systems. Comet plans to change focus of ACESAT, which has been primarily in the field of government and commercial installations, and will stage a two day "open warehouse sale" to clear out existing inventory acquired with ACESAT (Comet at tel 61-2-9256-2411).

In-flight DBS reception is coming to airlines serving North America, later Europe. New Harris Corp antenna system makes possible tracking of satellite while aeroplane is in flight; passengers will have seat-back TV screen access to range of news, sport and other services within 12 months.

RCA is giving away US\$399 DSS (DBS) satellite television home reception system to buyers of any of 14 different analogue TV receivers in 32 to 61" screen range.

DirecTV, in wake of financial collapse of competitor Alphastar DTH service in August, has offered former Alphastar subscribers free DSS hardware if they agree to purchase DirecTV Total Choice programming package which begins at US\$29 per month.

Loral is building new Ku-band DBS satellite with 11 transponders available to it for 166W location. Under terms of FCC sanctioned agreement, Loral has until August 15, 1999 to complete satellite. How it might be used, to serve Pacific region, has not been announced.

Echostar 4 DBS satellite is now set to launch to 148W in February-March time frame. Like Loral satellite at 166W location (above), Echostar 4 at least has the technical capability of serving a wide portion of the Pacific if by design it wishes to do so. Company has held back precise footprint coverage of satellite to date. An aside: Lawsuit in which Echostar is suing News Corp for failure to complete February announced partnership deal (called off in April) is now scheduled to begin June 1, 1998 and last 5 weeks.

US satellite TV viewers who subscribe to service packages offering "Super Stations" (broadcast TV stations that have national reach because of satellite relay) are being told they will now pay additional US\$0.27 per satellite channel per month under terms of new copyright payment schedule. Packagers of TV programming channels offering these channels are crying "foul" and pointing out that same "super station" channels delivered to homes through cable TV systems cost subscribers 3 to 10 cents per month per channel for copyright royalty.

News Corp profit rose 6% for fiscal year ending June 30; US\$1.006 billion. However, write-off of HarperCollins publishing subsidiary (US\$448 million) reduced actual profit to more modest US\$561 million. BSkyB DTH service profits in UK rose 22% on revenue growth of 26% with 8.4 million subscribers (cable and DTH) claimed at fiscal year end. In annual report issued September 10, Rupert Murdoch claimed News Corp "has a war chest of US\$2.7 billion" which will be utilised to "implement growth strategy world-wide." Cash is to be used to finance additional acquisitions "without placing in jeopardy the firm's present investment quality credit rating."

Japan Sky Broadcasting has decided to use the same equipment for DTH reception as competitor PerfecTV! is using. News Corp backed JSkyB also plans to use the same conditional access system as PerfecTV which simply means PerfecTV's already established base of more than 350,000 subscribers will be able to switch to JSkyB with a modest antenna readjustment. Surprise here is that at least in Japan, News Corp has decided not to force use of the Pace series receivers which are the standard product used by 'Sky' (and Star) services elsewhere.

ISkyB, India Sky broadcasting venture, has run into legal challenges in launching in that country. Indian parliament is to consider complicated legislation that will, if adopted, pave way for sale of ISkyB programming throughout India. But for now, the legislation is stalled and government ruling says that it is presently illegal to offer for sale, to sell or to collect money for services such as ISkyB is already operating through a PAS-4 Ku band beam to India. The net effect here is while News Corp may have control of valuable PAS-4 transponders to

"Instructive and fascinating" (Howard Rosenberg, The Los Angeles Times)
"A devastating critique of television's profound manipulateness" (Stephen Holden, The New York Times)

Anyone who has spent time around a satellite dish receiving system is aware that news coverage originates at a source and is sent in raw (unedited) form to a news programmer (CNN, TVNZ, et al). It is only after being received by the news programmer that individual decisions are made as to the use of the material, how it will be edited for broadcast use, what words will be written to surround the original field report.

American Brian Springer spent several years with a pair of home satellite dishes cruising America's satellite arc searching out inward bound news feeds. Shortly he had recorded more than 500 hours of material and realised that as America was in the midst of the 1992 national election, he had an excellent opportunity to "listen in" on what might otherwise be considered "private conversations" between Presidential candidates and a variety of



Larry King: "Ted Turner changed the world... He would serve you, you know what I mean... I'd call him after you're elected..."

newsmakers. Out of this has come a television documentary he called SPIN; the art of turning an unpleasant situation into one that would work to the benefit of the politician.

SPIN is 58 minutes in length, very professionally created and edited, and provides exceptional insight into American political life. The essence of Springer's focus is on those moments before and after a broadcast interview when politicians are receiving staff advice, are exchanging quips with interviewers (see above Larry King suggestion that Bill Clinton, "when elected," contact CNN boss Ted Turner to "serve" in the Clinton administration).

SPIN is all about how television, accidentally or on purpose with or without a political motive dresses up interviews and dresses down those being interviewed which the media does not support. The agenda's uncovered by Springer, the actual words of candidates and their staffs said when they thought the words were private, have all been intercepted off of satellite feeds and recorded. You will never look at news again in the same way.

CTD heartily endorses this tape for its education and entertainment value.

PAL format US\$59.95 by credit card on VHS tape from Brian Springer, 70 North Pearl Street, Buffalo, New York 14202 fax ++1-937-767-2327, email brianspr@buffnet.net.

serve India, the Indians will not allow the service to be promoted or sold on the ground there until new legislation is adopted.

Troubled German digital pay TV provider DF-1 is merging with competitor Premiere. Kirch owned DF-1 has, after one year, found itself unable to attract German subscribers to its multi-channel MPEG digital package and it is because of this failure that Europe (and the rest of the world) has been awash in so-called "d-Box" Nokia receivers which were manufactured for this service. Future of the DF-1 service is unknown at this time.

Acer, Taiwan based computer firm, with significant (but undefined) holdings in SPACE TV Systems project on Ku-band 177E Intelsat, reported 33% decline in earnings in first half of 1997; blamed alliance with US firm Texas Instruments for losses. How the decline in profits will impact on SPACE TV Systems is unknown but worth watching. SPACE TV Systems Mandarin Chinese service went to conditional access mode September 12.

Digital TV & Radio

Transition from analogue to digital TV in U.S. may hinge upon "tower space availability." Most American TV markets have 1,000 to 2,000 foot steel towers which hold the transmission antennas for one or several of the TV broadcasters, FM radio stations, and a range of two-way radio and cell phone transmission systems. Problem is that while TV stations will convert to digital, they will continue to transmit analogue as well for many years. Digital is on new channel and requires new transmitting antenna as well as transmission line. If present tower for say Cincinnati already holds 7 TV channel transmitting antennas with analogue service, same tower will have to hold 14 antennas for analogue plus digital. In most cases, towers cannot support twice their present antenna load, safely. In each situation, TV broadcasters have to weigh costs of building new, second tower, or where practical move the existing FM and two-way radio users off of the tower to make space for the new digital TV transmission antennas. If these non-TV users are forced to move, they will then require a new tower of their own. Bottom line - more than 1,500 new towers to support transition to digital when down the road after analogue is turned off, and the present analogue transmission antennas can be removed, the need for the additional towers will have evaporated. Billions of dollars are involved in this - more in many cases than the TV broadcasters will spend to acquire the hardware necessary to transmit network digital programming fed to them.

Sony has revealed its plan to make terrestrial digital TV a fast seller in the consumer marketplace. Firm believes key to DTV replacing existing analogue system is to create receivers which offer digital features at or very close to present analogue pricing. From a start-up of zero production for the new DTV receivers, this is turning out to be a considerable challenge. Sony believes they have found a technical way to combine the best features of all of the variations in digital TV (DTV) and high definition TV (HDTV) into a single receiver chassis without creating a pricing barrier that stops consumers from buying. Sony's key is to offer a TV receiver design which can automatically sense the presence of HDTV, DTV or even data transmissions, and adjust itself to function in the format that it senses. They believe the TV receiver must be transparent to the data stream differences and totally automatic in adjusting itself for best quality reception regardless of the data stream components. Many TV broadcasters in the U.S. have suggested they believe HDTV will be used primarily for (evening) prime time viewing and sports initially, and will grow slowly from that base to include an increasing share of the total broadcast day. This says the consumer television receivers should be capable of detecting a change over in transmission format, and without any user adjustment or interpretation, automatically switch to the new transmission format. The same principle will apply to channel surfing which will involve increasingly larger numbers of transmission data stream options in the coming years. To equalise the differences between SD (standard definition) digital, expanded definition digital (EDD) and HDTV, Sony has created a receiver that turns virtually all images into an HDTV level of display "whether they come in that way or not." Many present receivers use a technique known as line doubling to create expanded resolution for the horizontal image element on larger display screens. Sony says their new digital TVs will utilise a form of line doubling in both the horizontal and vertical displays on the screen, giving SD and EDD services the same "HD-like" resolution.

Consumer Electronics

Warner Home Video (WHV) has made good on promise to expand DVD (video CD disc) sales from original 7 market limited test to national roll-out in U.S. This signals the long anticipated move from controlled distribution of video CDs to a nation-wide marketplace; 10,000 stores are expected to handle the discs by the first of November. Retailers are investing US\$2,949 for kiosk display equipped with Toshiba TV, three DVD players and 40 DVD discs plus sizeable supply of promotional material. Kiosks promote sale of DVD players, discs as well as offer at local store option possibility of renting out players and discs for one night viewing.

DVD will not launch in Europe until "end of first quarter of 1998" according to industry sources appearing at Berlin IFA show. However, Panasonic reports it will offer the DVD-A350 player for 1,700 German marks late in November. As with DVD introduction in North America, the pacing item will not be release of DVD players but rather than availability of software (movies on disc). Warner Home Video, the leading DVD movie producer in U.S., believes 100 "titles" will be available for European distribution "by the end of March" growing to 250 titles "by the end of 1998." Movie studios are still insisting that new movie releases be staged world-wide, that

movies first offered on disc in North America not be available outside of North America until they give approval. Discs will have "regional encoding" which will prevent them from being hand carried from North America to Europe and played there on European sourced machines. Of course way around this is to acquire North American machine and use it for playback of discs sourced at early release times in U.S. Secondary problem is lack of full compatibility between audio processing for discs released in Europe, and, North America. U.S. discs have audio in Dolby AC-3 format while discs to be sold in Europe will have audio in MPEG-2 format. While it is possible for a single player to respond to either audio format, there is limited interest on the part of DVD players to make players function with both on the theory that Europeans will buy European discs, North Americans will buy North American discs and neither needs the other's audio transport stream processing capability. MPEG-2 audio is the "standard spec" audio process for all PAL and SECAM countries which will, eventually, include New Zealand and Australian product releases as well.

Disney Studios will enter DVD marketplace with classic Disney products on disc "before Christmas." The film studio has been one of two majors to hold back a DVD decision (Paramount is the other).

Sony is releasing second generation WebTV product which has 1.2 Gb storage capability that allows "temporary storage" of data, Email, even video clips. Concept is that WebTV users can have material downloaded "overnight" for review next day. The 1.2 Gb storage acts more like a RAM than traditional hard drive or disc storage. Price of new decoder is US\$299 retail. As incentive to purchase Sony version of WebTV, buyers are being given one year free subscription to "WebSite for TV."

WebTV has announced a major upgrade in its set-top Internet accessing data reception system; WebTV Plus. Few details are available but WebTV claims the new proprietary system uses VideoModem technology to increase the data rate throughput from a previously claimed 400 kbps to 1 Mbps. The firm says VideoModem will deliver two different data streams through the standard TV signal delivery mechanism now in use. One of these data streams will be broadcaster augmented with programmers using this technology to expand the actual video programme. Sporting events such as Monday Night Football are already using this new service to supply viewers with game and team statistics which appear as a viewer optional overlay on top of the normal event video. The second data stream contains regular format Internet for the user. Still ahead, the next generation box from WebTV will include input from new corporate owner Microsoft which believes that with the right software designs an entirely new level of data can be delivered to the TV viewer simultaneous to the regular TV programming through digital TV broadcasting techniques.

Canon has introduced industry first (NTSC) digital camcorder capable of normal interlaced or computer-friendly progressive scan mode. Device will allow video recorded in non-interlace to be directly coupled into PC for editing and to create flicker free still photos. Mini-DV format is similar in physical size and operation to 35mm SLR (film) camera. Outputs are in IEEE-1394 for direct PC connection, S-VHS. Optional: Infrared range finder for automatic focus under difficult lighting situations.

Music distributors in U.S. are pondering so far unexplained 9.7% drop in sales of CD albums during first 6 months of 1997 against year prior results. This is the first such 6 month decrease in sales since tabulations began in 1983.

Cable/Fibre/MDS/Pay TV

Sky NZ's new ownership structure, 48% by Murdoch controlled INL, comes before Annual General Meeting of INL on October 17th. This may seem like a relatively minor step in the approval process for sell-down by American cable TV and telephone interests held by TCI, Time Warner, and NZ Telecom parent Bell Atlantic; it could prove to be otherwise. Sky's internal plan, apparently with approval of majority of other stockholders, is to move from a privately held firm to a public corporation with considerable speed - some suggestions are as soon as before the end of this year. One possibility - that at INL AGM, there will be a proposal (for ratification) that INL backs a move to go public promptly. It would not be a surprise to have a post-INL AGM announcement to the effect that Sky's present stockholders plus INL have agreed to the detail of a public stock offering. Alas, there are some unsettling unknowns. To make the public float a success, the marketplace has to accept a valuation of Sky that is just a nudge lower than NZ\$1 billion. NZ Bancorp in a study released to security analysts late in August came to the reasoned conclusion that while INL is purchasing their 48% for NZ\$308.9 million, Bancorp argues the 48% is really valued (by their study) at NZ\$479 million. The purpose of the "unusual" Bancorp report was presented to analysts as a prologue to a public float of Sky. The public will be asked to buy stock based upon the Bancorp analysis and to overlook that INL has just managed to acquire 48% of Sky for NZ\$170 million less than the Bancorp valuation. Analysts are not certain they can overlook this differential. Three areas undisclosed to date by Sky in their financial reports bother analysts. One: What is the real cost of programming for Sky, now and in the future as new programming channels become available? Two: What will the cost of buying and operating the new digital multiplexing hardware be and how will these costs affect the bottom line (profit or loss) of Sky in the near term? Three: What will the extent of

subsidy (already called the "subsidy differential" or SD for short) be for each consumer digital dish system? Sky is admitting, as it cannot be disguised, that the true cost of each digital home receiving package will exceed any realistic number which Sky can collect from subscribers as an installation fee. Elsewhere in the world, Murdoch's BSkyB will charge consumers NZ\$300 for a satellite dish system which may at best equal 60% of the real cost. The difference between real cost and consumer cost is the "SD" amount which BSkyB will carry as debt until the subscriber revenue income results in sufficient profit to repay that (SD) debt. The Australian experience with Galaxy is the most blatant example of a high SD cost becoming a millstone around the neck of the pay TV operator (at one point Galaxy was charging A\$19.95 installation for an equipment package that was costing the firm in excess of A\$1,100). One of the side effects of "going public" with the Sky stock will be that many of the internal "secrets" regarding how Sky is structuring itself for the changeover to an expanded digital multi-channel universe will become increasingly public. Bottom line? Sky needs a degree of approval and support from financial market analysts to bring off a successful public float; it is by no means certain this will happen.

Foxtel Cable TV has increased subscription rates upward; a "basic" service connection (26 channels) went up A\$3 August 29th, connection for a second TV outlet is now A\$12.

Foxtel officials say they will take over formal operation of ailing Australis (Galaxy) on November 4th, regardless of whether the Australian government approves the deal or not. Australis Media has announced a loss of A\$297.5 million for the year ending June 30th, now claims 110,000 subscribers through MDS and satellite. It also claims a net gain of 13,000 subscribers since February 1. To block the Foxtel take-over of Australis, competitor Optus Vision has gone to court against Foxtel partner Telstra and is seeking A\$900 million in damages it claims it has suffered from Telstra practices.

British Tel (BT) claims it will give free software to customers that will allow them to compress video for retransmission over standard telephone lines as 8Mb MPEG-2 files. Test is to "salt" the customer base with the capacity to transmit their own video, and then see if this results in use of the software (and therefore greater use of the telephone circuits).

Cost of sports coverage is a concern to American cable TV industry. Citing escalating salaries for major sports and stars (one NBA player recently signed for US\$100 million for a single season of play which works out to \$1.2 million per game!), cable television trade association said, "regardless of which seats they are in - at home in front of the TV screen or in the sport venue, this level of salary escalation is going to trickle down to greater cost for events and therefore greater cost for spectators."

Tests of two-way wireless cable (MDS/MMDS) in Boston has become a permanent facility. US government has approved wireless cable operator utilising 10 MHz of spectrum space in 2,300 MHz band for "return link connections" within which individual wireless subscribers can interact with their set-top decoder units, order specific events, communicate directly with wireless operator.

Power of tens. MediaOne cable TV operator in North American says its 10 Mbps cable TV modems have now been ordered by 10,000 of the 1,000,000 homes passed by the system, after one year of service availability.

Terrestrial Broadcasting

TAB Gaming Entertainment plans to add an audio sub-carrier to one of the two existing Sky Network Videocrypt Ku band Optus channels to distribute audio (only) horse racing. The plan is to launch the service on or before December 15 with 24 horse races to be broadcast between 2.30 and 7PM seven days per week. Users will require a Sky satellite dish system. There is some confusion concerning charges. TAB advises the "Satellite dish will cost between \$350 and \$400" and existing Sky subscribers will pay an additional fee of \$39.67 per month" for what appears to be access to the audio sub-carrier. TAB also states, "If you do not have Sky (satellite) you will need to sign up with a full commercial subscription." What does not "fit" here is that with the existing Videocrypt Sky conditional access system, the aural sub-carrier is "in the clear" even when receiving a scrambled picture (i.e., the receiver is not authorised). How TAB and Sky plan to encode the extra aural sub-carrier to prevent access "without a Sky subscription" or how they plan to keep existing Sky satellite subscribers from gaining access to the new TAB aural sub-carrier is a bit of a mystery. Seemingly, anyone with a Sky (or self supplied) appropriate Ku band dish and receiver will be able to access the Australian origin horse racing coverage without anyone's authorisation or approval. The same TAB announcement also advises they expect to "have Trackside television available via satellite August 1, 1998 - or earlier."

Australia's tentative plan to convert existing analogue TV broadcasts to digital is expected to be formalised late this year. The preview suggests a 15 year conversion period (starting in 2000) during which both analogue and digital would operate, the government would "give" new spectrum to existing analogue broadcasters and a freedom for the broadcasters to elect to transmit HDTV or up to 6 digital SD (standard definition) programme channels in the same spectrum space. The existing networks want government to agree not to authorise further terrestrial TV broadcasters for the 15 year period, to help offset the considerable investment facing terrestrial broadcasters for this conversion.

